CLAIMS

1. *(ORIGINAL)* An apparatus including a transimpedance amplifier with controllable noise reduction, comprising:

amplifier circuitry including input and output terminals, and responsive to reception of an input signal and a compensation signal via said input terminal by providing an output signal via said output terminal, wherein

said input signal includes an AC component and a DC component,

said compensation signal includes a DC component inverse in polarity to said input signal DC component, and

said output signal includes an AC component corresponding to said input signal AC component, and a DC component comprising a sum of first and second DC subcomponents, wherein said first DC subcomponent corresponds to said input signal DC component; and

control circuitry coupled to said amplifier circuitry input and output terminals, and responsive to reception of said output signal DC component and a reference signal including a DC component by providing said compensation signal, wherein

said reference signal DC component comprises a sum of third and fourth DC subcomponents,

said third DC subcomponent corresponds to said second DC subcomponent, and

said compensation signal DC component corresponds to a difference between said first and fourth DC subcomponents.

2. *(ORIGINAL)* The apparatus of claim 1, wherein said amplifier circuitry comprises a transimpedance amplifier.

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3. *(ORIGINAL)* The apparatus of claim 1, wherein said amplifier circuitry comprises a differential amplifier and resistive circuitry coupled between said input and output terminals.

4. *(ORIGINAL)* The apparatus of claim 1, wherein said control circuitry comprises signal comparison circuitry responsive to a comparison of said output signal DC component and said reference signal DC component by providing a control signal.

5. *(ORIGINAL)* The apparatus of claim 4, wherein said control circuitry further comprises current source circuitry responsive to said control signal by providing a current as said compensation signal.

6. *(ORIGINAL)* The apparatus of claim 4, wherein said control signal has a value related to said difference between said first and fourth DC subcomponents.

7. *(ORIGINAL)* The apparatus of claim 1, wherein said fourth DC subcomponent corresponds to a minimum one of a plurality of values comprising a predetermined value related to said first DC subcomponent and a predetermined value related to said output signal AC component.

8. *(ORIGINAL)* The apparatus of claim 1, wherein said compensation signal DC component has an approximately zero value when said input signal DC component has a magnitude less than a predetermined value.

9. *(ORIGINAL)* An apparatus including a transimpedance amplifier

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with controllable noise reduction, comprising:

amplifier means for receiving an input signal and a compensation signal and in response thereto generating an output signal, wherein

said input signal includes an AC component and a DC component,

said compensation signal includes a DC component inverse in polarity to said input signal DC component, and

said output signal includes an AC component corresponding to said input signal AC component, and a DC component comprising a sum of first and second DC subcomponents, wherein said first DC subcomponent corresponds to said input signal DC component; and

controller means for receiving said output signal DC component and a reference signal including a DC component and in response thereto generating said compensation signal, wherein

said reference signal DC component comprises a sum of third and fourth DC subcomponents,

said third DC subcomponent corresponds to said second DC subcomponent, and

said compensation signal DC component corresponds to a difference between said first and fourth DC subcomponents.

10. *(ORIGINAL)* An apparatus including a transimpedance amplifier with controllable noise reduction, comprising:

an input terminal to convey an input signal and a compensation signal, wherein

said input signal includes an AC component and a DC component, and

said compensation signal includes a DC component inverse in polarity to said input signal DC component;

an output terminal to convey an output signal which includes an AC component corresponding to said input signal AC component, and a DC component comprising a sum of first and second DC subcomponents, wherein said first DC subcomponent corresponds to said input signal DC component;

a reference terminal to convey a reference signal including a DC component corresponding to a sum of said second DC subcomponent and a DC offset;

first amplifier circuitry coupled to said input and output terminals, and responsive to reception of said input and compensation signals by providing said output signal;

second amplifier circuitry coupled to said output and reference terminals, and responsive to reception of said output signal DC component and said reference signal by providing a control signal with a value related to a difference between said first DC subcomponent and said DC offset; and

signal generator circuitry coupled to said input terminal and said second amplifier circuitry, and responsive to reception of said control signal by providing said compensation signal.

11. *(ORIGINAL)* The apparatus of claim 10, wherein said first amplifier circuitry comprises a transimpedance amplifier.

12. *(ORIGINAL)* The apparatus of claim 10, wherein said first amplifier circuitry comprises a differential amplifier and resistive circuitry coupled between said input and output terminals.

13. *(ORIGINAL)* The apparatus of claim 10, wherein said second amplifier circuitry comprises signal comparison circuitry responsive to a comparison of said output signal DC component and said reference signal DC

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component by providing said control signal.

14. *(ORIGINAL)* The apparatus of claim 10, wherein said signal generator circuitry comprises current source circuitry responsive to said control signal by providing a current as said compensation signal.

15. *(ORIGINAL)* The apparatus of claim 10, wherein said compensation signal DC component corresponds to a difference between said first DC subcomponent and said DC offset.

16. *(ORIGINAL)* The apparatus of claim 10, wherein said DC offset corresponds to a minimum one of a plurality of values comprising a predetermined value related to said first DC subcomponent and a predetermined value related to said output signal AC component.

17. *(ORIGINAL)* The apparatus of claim 10, wherein said compensation signal DC component has an approximately zero value when said input signal DC component has a magnitude less than a predetermined value.

18. *(ORIGINAL)* An apparatus including a transimpedance amplifier with controllable noise reduction, comprising:

first amplifier means for receiving an input signal and a compensation signal and in response thereto generating an output signal, wherein

said input signal includes an AC component and a DC component,

said compensation signal includes a DC component inverse in polarity to said input signal DC component,

said output signal includes an AC component corresponding to said input signal AC component, and a DC component comprising a sum of first and

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second DC subcomponents, and

said first DC subcomponent corresponds to said input signal DC component;

second amplifier means for receiving said output signal DC component and a reference signal and in response thereto generating a control signal, wherein

said reference signal includes a DC component corresponding to a sum of said second DC subcomponent and a DC offset, and

said control signal has a value related to a difference between said first DC subcomponent and said DC offset; and

signal generator means for receiving said control signal and in response thereto generating said compensation signal.

19. *(ORIGINAL)* An apparatus including a transimpedance amplifier with controllable noise reduction, comprising:

an input terminal to convey an input signal and a compensation signal, wherein

said input signal includes an AC component and a DC component, and

said compensation signal includes a DC component inverse in polarity to said input signal DC component;

an output terminal to convey an output signal which includes an AC component corresponding to said input signal AC component, and a DC component comprising a sum of first and second DC subcomponents, wherein said first DC subcomponent corresponds to said input signal DC component;

a reference terminal to convey a reference signal including a DC component corresponding to a sum of said second DC subcomponent and a DC offset;

first amplifier circuitry coupled to said input and output terminals, and

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responsive to reception of said input and compensation signals by providing said output signal;

second amplifier circuitry coupled to said output and reference terminals, and responsive to reception of said output signal DC component and said reference signal by providing a control signal; and

signal generator circuitry coupled to said input terminal and said second amplifier circuitry, and responsive to reception of said control signal by providing said compensation signal, wherein said compensation signal DC component corresponds to a difference between said first DC subcomponent and said DC offset.

20. *(ORIGINAL)* The apparatus of claim 19, wherein said first amplifier circuitry comprises a transimpedance amplifier.

21. *(ORIGINAL)* The apparatus of claim 19, wherein said first amplifier circuitry comprises a differential amplifier and resistive circuitry coupled between said input and output terminals.

22. *(ORIGINAL)* The apparatus of claim 19, wherein said second amplifier circuitry comprises signal comparison circuitry responsive to a comparison of said output signal DC component and said reference signal DC component by providing said control signal.

23. *(ORIGINAL)* The apparatus of claim 19, wherein said signal generator circuitry comprises current source circuitry responsive to said control signal by providing a current as said compensation signal.

24. *(ORIGINAL)* The apparatus of claim 19, wherein said control

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signal has a value related to a difference between said first DC subcomponent and said DC offset.

25. *(ORIGINAL)* The apparatus of claim 19, wherein said DC offset corresponds to a minimum one of a plurality of values comprising a predetermined value related to said first DC subcomponent and a predetermined value related to said output signal AC component.

26. *(ORIGINAL)* The apparatus of claim 19, wherein said compensation signal DC component has an approximately zero value when said input signal DC component has a magnitude less than a predetermined value.

27. *(ORIGINAL)* An apparatus including a transimpedance amplifier with controllable noise reduction, comprising:

first amplifier means for receiving an input signal and a compensation signal and in response thereto generating an output signal, wherein

said input signal includes an AC component and a DC component,

said compensation signal includes a DC component inverse in polarity to said input signal DC component,

said output signal includes an AC component corresponding to said input signal AC component, and a DC component comprising a sum of first and second DC subcomponents, and

said first DC subcomponent corresponds to said input signal DC component;

second amplifier means for receiving said output signal DC component and a reference signal and in response thereto generating a control signal, wherein said reference signal includes a DC component corresponding to a sum of said second DC subcomponent and a DC offset; and

signal generator means for receiving said control signal and in response thereto generating said compensation signal, wherein said compensation signal DC component corresponds to a difference between said first DC subcomponent and said DC offset.

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